

REMARKS

The present claims relate to an electric device, a method for driving the electric device, and a fuel cell.

Amendment summary

Upon entry of this amendment, claims 33-45 will be pending.

Claims 1-18 were previously canceled.

Claims 19-32 are canceled in this Amendment.

Claim 33 corresponds to previous claim 19, but states that the fuel is liquid at room temperature. Support is found on at least page 12 (the third full paragraph) of the specification and the last paragraph on page 17 of the specification.

Claims 34-41 correspond to previous claims 20-27.

Claim 42 includes the subject matter of previous claims 28 and 29.

Claims 43-45 correspond to previous claims 30-32.

The dependencies of all claims now correspond to claims pending in the Application.

No new matter is added by this amendment and Applicant respectfully submits that entry of the Amendment is proper.

Initial matters

The Office Action notes that the preliminary amendment previously filed canceled only claims 1-18. The Office Action treated claims 19 and 20 as being amended claims, rather than

new claims. Therefore, for ease of administration, this Amendment cancels the claims previously pending and, in essence, renumbers them by submitting them as new claims.

Standing of the claims

In the Office Action dated November 1, 2006, claims 19-27 and 29-32 were rejected under 35 U.S.C. § 112 for allegedly being indefinite. Claims 19 and 28 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Uchida in view of Johnson.

Response to rejection under 35 U.S.C. § 112 of claims 19-27 and 29-32

Applicant respectfully requests reconsideration and withdrawal of this rejection.

The Office Action rejected claims 19-27 and 29-32 under 35 U.S.C. § 112 for allegedly being indefinite because the phrase “ordinary temperature” was not adequately defined.

The phrase “ordinary temperature” was previously present in claims 19 and 29. Claim 19 is canceled in this Amendment, and claim 33 includes the subject matter of previous claim 19. Claim 29 is also canceled in this Amendment, and claim 42 includes the subject matter of previous claim 29. Present claims 33 and 42 specify that the fuel is liquid at “room temperature,” which is not indefinite. Therefore, Applicant respectfully requests reconsideration and withdrawal of this § 112 rejection.

Response to rejection under 35 U.S.C. § 103 of claims 19 and 28

Applicant respectfully requests reconsideration and withdrawal of this rejection.

The Office Action rejected claims 19 and 28 based upon the combined teachings of Uchida and Johnson. The Office Action cited Uchida for its alleged teaching of the basic structure of the claims and cited Johnson for its alleged teaching of the use within fuel cells of fuels that are liquid at room temperature. The Office Action cited as motivation for combining these references the relative ease and safety of such fuels and fuel cell systems.

The present claims relate to an electric device that comprises at least (1) a heat-producing section (which produces heat during operation); (2) a heat-dissipating section which is arranged adjacent to the heat-producing section (for removing heat produced in the heat-producing section); and (3) a fuel cell which serves as an electric power source and uses a fuel being liquid at room temperature. The claims also require that the fuel cell comprises a fuel-supply section and a power-generating section. In addition, at least part of the fuel-supply section is arranged in the heat-dissipating section of the electrical device. A similar fuel cell is also claimed.

Uchida discloses a miniaturized fuel cell assembly that includes a hydrogen storage unit. The fuel cell uses hydrogen and air as fuel and oxidant, respectively. It creates electricity by transporting hydrogen fuel from the hydrogen storage unit into the fuel cell body via a hydrogen supply means. Once in the fuel cell body, the hydrogen fuel interacts with an electrode to form free electrons and positively charged hydrogen ions. At the other electrode, those free electrons and positively charged ions are formed into water, and thus, a power source is formed. Uchida discloses that portable electronics may be powered by such a fuel cell.

Johnson is not directed toward a fuel cell. Rather, Johnson discloses a fuel supply, analogous to the hydrogen storage unit in Uchida. For ease of reference, the fuel supply

disclosed by Johnson will hereinafter be called a fuel storage unit. The fuel storage unit in Johnson is not itself a fuel cell. Instead, the fuel storage unit in Johnson merely stores fuel that is to be used within a fuel cell. The fuel within the fuel storage unit may be emptied out of the fuel storage unit and into a separate fuel cell when the fuel cell requires fuel. Importantly, the fuel storage unit disclosed by Johnson stores fuels that are liquid at room temperature. Therefore, the fuel storage unit disclosed by Johnson is used in conjunction with fuel cells that use fuels that are liquid at room temperature.

Applicant first submits that Uchida and Johnson constitute nonanalogous art. Though both appear to belong to the broad fuel cell art, Uchida discloses fuel cells that utilize hydrogen fuel. Johnson, on the other hand, discloses a fuel storage unit, rather than a fuel cell. Additionally, Johnson relates to a fuel storage unit for fuel cells that use fuels that are liquid at room temperature. The hydrogen fuel in Uchida is not liquid at room temperature, as the Office Action notes when it states on page 4 that Uchida “does not specifically teach the fuel being a liquid.” Nonetheless, the Office Action combines the teachings of Uchida and Johnson to allegedly arrive at Applicant’s invention. However, as discussed above, Uchida and Johnson constitute nonanalogous art and therefore Applicant respectfully submits that the combination of these references is improper.

Applicant further submits that even if Uchida and Johnson did constitute analogous art, which they do not, the combination of these references does not teach Applicant’s claimed invention. Uchida discloses a fuel cell that utilizes hydrogen fuel. Uchida does not disclose a fuel cell that uses fuel that is liquid at room temperature, as required by the present claims, nor

does Uchida teach how to adapt the fuel cell therein to use non-hydrogen fuel or any fuel that is liquid at room temperature. The Office Action relies upon Johnson to remedy this deficiency within Uchida. However, Johnson discloses a fuel storage unit for a fuel cell and does not teach the structure of a fuel cell. Johnson does not, for example, teach how to convert a fuel cell that uses fuel that is not liquid at room temperature (e.g. the fuel cell disclosed within Uchida) into a fuel cell that uses fuel that is liquid at room temperature. At best, Johnson teaches that liquid fuel could hypothetically be used in a fuel cell. In any event, Johnson does not disclose or teach a fuel cell that uses fuel that is liquid at room temperature or how to convert a fuel cell that uses fuel that is not liquid at room temperature into a fuel cell that uses fuel that is liquid at room temperature. Therefore, Johnson does not include any disclosure or teaching that one could use to remedy the deficiencies within Uchida.

In addition, combining the teachings of Uchida and Johnson would not cause one to arrive at Applicant's invention. If one were to use the fuel storage unit in the fuel cell of Uchida, it would be used to store the type of fuel used in the fuel cell of Uchida. Because Uchida discloses the use of hydrogen fuel (and not any fuel that is liquid at room temperature), the fuel storage unit, if used at all, would therefore store hydrogen, and not a fuel that is liquid at room temperature, as required by the present claims. Hence, Applicant respectfully submits that the combined teachings of Uchida and Johnson do not disclose or render obvious Applicant's claimed invention.

Applicant also respectfully submits that there is no motivation to use fuel that is liquid at room temperature in the fuel cell disclosed by Uchida. Uchida specifically discloses that

hydrogen is used as fuel, and Applicant notes that hydrogen is not liquid at room temperature. There is no mention within Uchida that any fuel that is liquid at room temperature could be used. Not surprisingly, there is also no indication anywhere in Uchida that the fuel cell that it discloses is compatible with liquid fuels. In the presence of the specific teaching of hydrogen fuel and in the absence of any indication that the fuel cell structure taught within Uchida is compatible with fuel that is liquid at room temperature, Applicant respectfully submits that there is insufficient motivation to alter the fuel cell in Uchida to use the fuel required by the present claims.

Further regarding motivation, Applicant respectfully submits that even if Uchida and Johnson were to be combined, there is no motivation to alter the combination to arrive at Applicant's claimed invention. First, as discussed above, there is no disclosure or teaching within Uchida that a fuel that is liquid at room temperature may be used in the fuel cell disclosed therein. Second, also as discussed above, if the fuel storage unit in Johnson were used with the fuel cell in Uchida, the type fuel used in such a combination would be the type of fuel required to run the fuel cell, namely hydrogen. The Office Action states that the fuel cell "system" in Johnson could be used in the fuel cell disclosed by Uchida. However, Johnson only teaches a fuel storage unit for fuel cells. Johnson does not teach that the fuel cell should be or could be altered to use the fuel held by the fuel storage unit. Rather, Johnson is concerned with providing a storage unit for the type fuel actually used by the fuel cell, and is not concerned with altering the structure of an existing fuel cell such that it uses fuel that is liquid at room temperature. Therefore, Applicant respectfully submits that there is no motivation to alter the combined

teachings of Uchida and Johnson in any manner that would lead one to arrive at Applicant's claimed invention, which requires the use of a fuel that is liquid at room temperature.

In view of the above, Applicant respectfully requests reconsideration and withdrawal of this § 103 rejection.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.


Respectfully submitted,

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